

Supervised-machine Learning for Intelligent Collision Avoidance Decision-making and Sensor Tasking

Completed Technology Project (2017 - 2018)



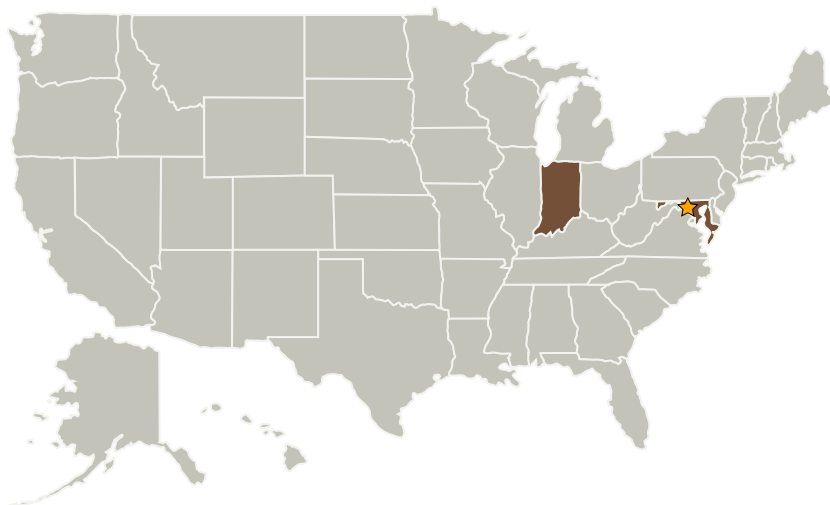
Project Introduction

Building an autonomous architecture that uses directed self-learning neuro-fuzzy networks with the aim of developing an intelligent autonomous collision avoidance decision-making process; including ground and space based sensor tasking and data transfer for on-board autonomous maneuver decision.

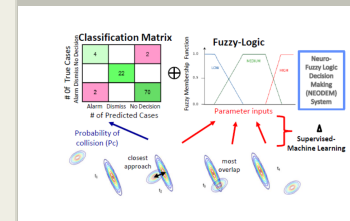
Anticipated Benefits

This will allow for robust autonomous decision making involving the improvement of the initial uncertainties, knowledge of information quality and decision fidelity that will provide potential cost savings for sensor operations, reduce false alarm maneuvers and improved asset protection.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Goddard Space Flight Center (GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Purdue University-Main Campus	Supporting Organization	Academia	West Lafayette, Indiana



Supervised-Learning parameter-set determination for satellite collision avoidance using neuro-fuzzy logic based decision making.

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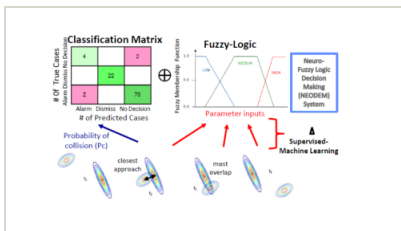


Primary U.S. Work Locations

Indiana

Maryland

Images



Supervised-machine Learning for Intelligent Collision Avoidance

Supervised-Learning parameter-set determination for satellite collision avoidance using neuro-fuzzy logic based decision making.

(<https://techport.nasa.gov/image/28229>)

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Managers:

Jason W Mitchell

Timothy D Beach

Principal Investigator:

Alinda K Mashiku

Co-Investigators:

Nargess Memarsadeghi

Carolin Frueh

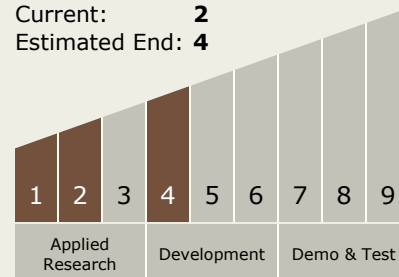
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Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **4**



Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.5 GN&C Systems Engineering Technologies
 - └ TX17.5.2 GN&C Fault Management / Fault Tolerance / Autonomy

Target Destinations

Earth, Foundational Knowledge